5. AIR AND SPACE ISSUES AND PLANNING

(Also see topics 2.7, 2.8, 4.39, and 6.19)

5.1. What is the role of contractors within the military? (Also see topic 2.8)

- Where is the line between the two?
- Examine what military missions should be contracted out.
- What is the difference between contractors serving under battlefield and non-battlefield conditions?
- What should be the role of Guard and Reserve forces? What are some model criteria? Are there different models for different situations (e.g. crisis v. steady state)?
  - What about the idea of "sponsored Reserves" – reservists working in positions they can be called up to do as military personnel?
  - Examine the idea of contractors being called up and the difference in their pay as contractors and active duty personnel is paid by the contractor.
- Re-look at rules for transitions from active duty to contractor. What limitations are needed and which are onerous?
- What are the rules of engagement for civilian contractors?
- Who is a combatant, especially as contractors become more involved in combat-type activities?
- What are the UCMJ issues that arise?
- How is command authority handled?
- Examine issues of pay and insurance.
- What complications arise in separating the roles of contractors who are called up as part of the reserve component and may then work alongside other contractors?

Priority: 1
Key Terms: contractors, privatization, A-76, reserves, legal, ROEs

5.2. Which organization should be responsible for the planetary defense mission?

- What would this mission entail?
- What capabilities would be required?

Priority: 1
Key Terms: Space Command, space operations, NASA

5.3. What are the factors when setting up an organization to handle post-conflict stability operations and reconstruction?

- What is the best way to make this flexible and adaptable to the situation on the ground?
- What is the Air Force role in this?
- What is DOD's role?
- What is the relationship between the State Department and DOD? Which has the lead?

- Review the latest directives and guidance on such operations and identify the requirements from them that DOD and the Air Force are expected to meet.
- What should be the role of AF reserve component forces in stability operations?
- Should there be a standing Joint Task Force with the State Department in Washington, DC for these operations?
- What is the US and DOD policy for dealing with "ungoverned spaces" around the world?

Priority: 1
Key Terms: OIF, OEF, MOOTW, SASO

5.4. Examine the stresses of high OPSTEMPO on the Air Force reserve components.

- What roles are they playing and what should they be playing?
- How does this vary by career field?
- What outside factors would influence this?

Priority: 1
Key Terms: tempo, retention, recruiting, Guard, Reserve

5.5. Can integrating active and reserve component units improve operational efficiency?

- What are optimal active component/reserve component ratios for integrated units (including fighter, bomber, strategic airlift, space operations)?
- What tasks are best suited for Guard and Reserve forces?

Priority: 1
Key Terms: tempo, organization, Guard, Reserve

5.6. How can the Air Force best organize, train, and equip for UAVs, as well as control and operate them?

- How was the idea of fighter squadrons devised and what lessons from that exist for organizing Air Force UAVs?
  - How can UAVs be organized into the Air Force? Are there better ways than squadrons, such as by task?
- Define what a UAV is. Should they be defined by range (strategic v. tactical), by payload, or some other way?
- What would a UAV look like that was built for long-range strike or persistent strike?
- How does the military control and deconflict this ever-growing number of aircraft?
- How does the military handle the bandwidth needed for aircraft control and sensor exploitation?
- What are the optimal capabilities that can be put into a UAV?
- What can a UAV do that a piloted aircraft cannot?

Priority: 1
Key Terms: UAV, C2, command and control, ISR, bandwidth, organization

5.7. How can the US increase the number of aerospace engineering students, especially relative to other countries?

- What infrastructure needs to be improved for US aerospace?
- How can the Air Force provide incentives?

Priority: 1
Key Terms: infrastructure, engineering, recruiting, research, development, R&D

5.8. How can the Air Force logistically support the Army and Marine Corps distributed and re-supply operations?

- What are the relative costs of the current hub-and-spoke logistics system vice a precision airdrop capability?

Priority: 1
Key Terms: logistics, joint operations, OIF, OEF, mobility, airlift

5.9. How can the transition from basic science to engineering and fielded systems be speeded up?

- How can technology demonstrations be operationalized?
- What should be the Air Force role in developing the next generation of fully re-usable launch vehicles?
- What about the next-generation SBIRS?
- How can DOD develop an acquisition system that will produce a product in four years or less?

Priority: 1
Key Terms: acquisitions, procurement, R&D, case studies, lessons learned, technology, transformation, space operations

5.10. What does the European Galileo system mean for US warfighters?

- Will there be interoperability issues as allies use Galileo and the United States uses GPS?
- Will the United States jam Galileo in a conflict to deny adversary access?

Priority: 1
Key Terms: R&D, case studies, lessons learned, technology, transformation, space operations, ESA, European Space Agency, EU, European Union

5.11. What doctrine, equipment, organizational structures, and tactics, techniques, and procedures are needed to effectively support ground-based special operations forces across the wide range of contingency operations?

- How might establishing a UAV squadron meet this need?
- What modifications are needed to AFDD 2-7 to reflect USSOCOM's role as a supported combatant command?
- What capabilities are needed to provide cover/protection to ground-based special operations forces inserted well behind "enemy lines"?
- What organizational changes are needed for the air operations center to act in support of SOF?
- Write unclassified case studies of recent campaigns.

Priority: 1
Key Terms: special operations forces, doctrine, contingency operations, joint operations, special ops, case studies, lessons learned, USSOCOM, AFSOC, SOF, CCT, PJ, AOC

5.12. Examine the domestic use of military assets.

- How will various military assets (ISR, C2, mobility) be used domestically in homeland defense and crisis management and what is NORTHCOM's role? How will these assets be tasked?
- What is the role of the Air National Guard in NORTHCOM homeland defense missions and how does it compare with their Title 32 responsibilities to their states?
- What role does NORTHCOM have in continuity of government and continuity of operations? What might the Air Force be asked to do?
- Are there service responsibilities that might fall under NORTHCOM's mission? (ex. UAVs, high-altitude airships, ISR)
- How can space assets be used to support NORTHCOM's domestic mission?
- How does the Coast Guard contribute to NORTHCOM's mission?
- How can DOD assist the Department of Homeland Security with border and transportation security, through the Border Patrol and Customs?

Priority: 1
Key Terms: NORTHCOM, homeland defense, homeland security, Air National Guard, total force, interagency, GWOT, war on terrorism, legal

5.13. What role does air and space power have in the urban operation environment?

- What capabilities exist within the USAF that make it uniquely qualified to project air and space power in the urban environment?
- Are the other services better suited to project air and space power within the urban environment?
- Would the 'operationalizing' of unmanned combat aerial systems improve the USAF's capabilities to apply air and space power in the urban environment?

- Does USAF doctrine adequately address the application of air and space power in the urban environment?
- What is the US policy/doctrine with regard to the autonomous application of air and space power in the urban environment?
- What effect will emerging technologies (e.g., directed energy capabilities, persistent area dominance munitions, micro-UAVs, unattended sensors) have on the USAF's application of air and space power in the urban environment?
- Write unclassified lessons learned from operations in Afghanistan and Iraq.

Priority: 1
Key Terms: urban operations, joint operations, UCAV, doctrine

5.14. How would expansion of UAV assets and other network-centric systems affect spectrum allocation?

- Examine spectrum allocation for UAVs in a theater.

Priority: 1
Key Terms: UAV, UCAV, bandwidth, transformation, AOC

5.15. How can allies best contribute to the Air and Space Expeditionary Task Force (ASETF), Combined Air Operations Center (CAOC), space operations and theater defenses?

- How might allies be included in and contribute to a warfighting HQ?
- What kind of architecture needs to be developed in order to operate the ASETF, CAOC and/or space operations and theater defenses in a coalition environment?
- How would these contributions improve nation-to-nation and military-to-military relations?
- Do recent operations show communication and capability gaps between the US and its allies? How can the capability gaps be fixed?
- Can other states be encouraged to specialize in particular competencies that can contribute to a coalition effort? What is the impact of a state with a particular specialty which does not participate in an operation?
- How do differences in spectrum use affect allies' ability to contribute?
- What can be done to minimize friendly fire incidents in terms of policy, training, CONOPS, and technology?

Priority: 1
Key Terms: allies, AEF, AOC, space operations, theater defense, security consequences, mil-to-mil relations

5.16. Examine the development of Foreign Area Officers (FAO) and the skills they require.

- How can FAOs be tasked and assigned?

    - How should their skills and abilities be highlighted to make them more visible?
- How can FAOs contribute to Predictive Battlespace Awareness in terms of cultural knowledge and understanding?
- What capabilities can FAOs offer to a commander?
- What skills do FAOs need to be most effective?
- How might they contribute to HUMINT?
- Should there be a dedicated career field for FAOs? What is an appropriate career development path for these personnel? How can their FAOs skills be maintained if it is a secondary duty?
- How could FAOs be used to provide pre-deployment cultural training?

Priority: 1
Key Terms: FAO, HUMINT, personnel, common operational picture, COP, IPB, intelligence preparation of the battlespace

5.17. What should be the USAF role in NORTHCOM?

- What is the role of the Air Force District of Washington in National Capital Region defense?
- What authorities and policies exist to allow Air Force assets to be tasked?
- How should the Air Force, NORTHCOM, and the Department of Homeland Security interact?
- What USAF assets should be assigned to NORTHCOM?
- How can NORTHCOM best integrate with and support civilian agencies?
- What should be Guard and Reserve roles in NORTHCOM?
- How does First Air Force, as a component of NORAD, relate to NORTHCOM?

Priority: 1
Key Terms: ISR, mobility assets, Air National Guard, Reserves, total force, force protection, BMD, NMD, JFHQ-NCR

5.18. What is the optimum mix of systems to provide robust and reliable communications?

- Which technologies are best suited for "reachback" communications?
- Which are cheapest? Most survivable? Most reliable?
- What are the bandwidth issues?
- Which technologies are best suited to handle the last mile?
- Evaluate the potential of the following systems: laser communications, space systems, UAVs/high-altitude airships as relay, cellular systems, combat aircraft as relay.
- Is there a network architecture incorporating some or all of the above that is desirable? If so, how should such a system be developed?
- What tradeoffs should be examined in adding on-board processing to ISR and combat systems to reduce communication requirements?

- What commercial systems are likely to be available, and how does this affect this analysis? Can space assets be used as a "CRAF"-like concept?
- What are the costs, both to the military and to the civilian economy if these satellites are no longer available to their civilian customers?
- What commercial systems may be available to an adversary, and how does this affect the types of systems the US should use? What are the security implications?

Priority: 1
Key Terms: commercial space systems, satellite protection, surge capacity, CRAF, communications, imagery, remote sensing, shutter control, C2

5.19. What is the optimum mix of systems for potential future conflicts to provide robust and reliable surveillance, reconnaissance and gathering of intelligence?

- What are the most promising technologies for dealing with the WMD problem?
  - What is the tradeoff between air and space platforms?
- What role do ISR assets have in the spectrum of "Find, Fix, Track, Target, Engage, Assess" (F2T2EA)? In which areas of this spectrum is ISR weakest?
- Which technologies are best suited for electronic and signals intelligence? On what platforms or combination of platforms (space, high-altitude UAV, high-altitude airships, and aircraft) should these technologies be placed?
- What is the optimum mix of aircraft, UAVs, satellites, and sensors (optical, IR, laser, multi-spectral, hyperspectral) to provide surveillance and reconnaissance?
- With new radar and sensing technologies on the next generation of aircraft, is space sensing necessary?
- What systems are available to prospective adversaries? If they use these systems, can the US achieve either tactical or strategic surprise, or have we entered an era of transparency in military operations?
- How can/should the US deal with entities that use satellite or other ISR capabilities to aid adversaries?
- Can/should the US purchase all ISR capability (use "checkbook shutter control" to limit an adversary's use)? Will such a strategy always be possible?
- What are the implications of foreign investments in anti-ISR and other disruptive technologies?

Priority: 1
Key Terms: commercial space systems, satellite protection, surge capacity, CRAF, communications, imagery, remote sensing, shutter control, ISR

5.20. What are the implications of space situational awareness deficiencies for space control?

- Should there be a standing plan in response to an attack on US space assets?
- What policies, concepts of operations, and technologies are needed to improve space situational awareness? How can these be diffused across all space sectors?

- How can we tell if a satellite has been attacked? How will the source of the attack be attributed?
- What technologies are available or projected for adversaries and how might they use them against US assets?
- What are the consequences of the loss of space capabilities to the terrestrial warfighter?
- What could current capabilities provide in terms of responses?
- How should the current state of space situational awareness be advanced to better assist operational forces?
- When do/should the systems get integrated, earlier rather than later?

Priority: 1
Key Terms: situational awareness, space control, policy, satellite attack responses

5.21. How should the operations of multiple Intelligence, Surveillance, and Reconnaissance (ISR) platforms be integrated and fused?

- What is the appropriate C2 architecture for Processing, Exploitation, and Dissemination (PED) of theater airborne ISR assets?
- Where is the best location for ISR PED—in the AOC, via Reachback ops, split-based ops, or another option?
- Is a separate architecture needed for Time-Sensitive Targeting (TST) vice non-TST?
- With limited exploitation assets—facilities, equipment, and personnel—how are the increased demands from multiple, simultaneous operations and platforms handled?
- What is the appropriate C2 structure/relationship for ISR PED assets—especially Reachback PED assets--OPCON, TACON, or Direct Support?
- How does the USAF integrate and capitalize on Joint, Coalition/Allied and Total Force ISR PED capabilities?
- How should commercial assets be better incorporated to compensate for shortfalls in military ISR capabilities or availability?
- Are 'turf battles' likely between organizations owning the various platforms?
- Is there a CRRA panel for ISR?
- Discuss warfighting integration and the CIO.

Priority: 1
Key Terms: ISR, integration, reachback, PED

5.22. What force structure is required for the renewed air defense mission?

- Examine issues of cruise missile defense, ballistic missile defense, and layered defense generally.
- What have been the changes since 9/11?
- Where does NORTHCOM fit in, and what is its relationship with NORAD?
- What is the current and future mix and the active duty role, since most air defense was handled by the Air National Guard?

- Does the mission have an impact on acquisition?
- How does layered defense (i.e., missile and air defense) of the country drive AF roles, missions, and equipment?
- What is the policy for "shoot down" decisions?

Priority: 1
Key Terms: Noble Eagle, air defense, terrorism, total force

5.23 Perform a quantitative analysis of the CENTCOM Deployment and Distribution Operations Center (CDDOC).

- Quantitatively evaluate their performance over the last year contrasted with prior Joint Movement Center (JMC) performance.
- Objectively evaluate the DDOC construct and potentially validate it as a best practice, and then decide whether the DDOC should become part of Air Force and joint doctrine.

Priority: 1
Key Terms: CENTCOM, CDDOC, mobility, organization

5.24 Evaluate the use of the combatant commander's Directive Authority for Logistics (DAFL) in OIF/OEF.

- Should logistics forces be pooled together under the command of a logistics component commander?
- Should Services retain control of their own logistics?
- What's the appropriate balance between Service and combatant command control over theater logistics?
- Consider a case study of OIF and/or OEF logistics contrasted with Operation DESERT SHIELD/STORM.

Priority: 1
Key Terms: OIF, OEF, C2, logistics, organization

5.25 Airbase Opening (ABO) during Operation IRAQI FREEDOM (OIF).

- The transitions from seizure force to opening force to operating force were not smooth, and ABO planning was lacking – what guidance should be incorporated into joint doctrine to address these problems?
- To what degree are these problems attributable to deviation from existing joint doctrine?
- Consider a qualitative analysis in one or more ABO case studies (such as the opening of Talil AB, Iraq).

Priority: 1
Key Terms: OIF, logistics, airbase opening, ABO, AMC, austere bases, access, case study, joint doctrine

5.26 Air Force support to Army modular transformation—a historical perspective

- Consider lessons learned from WWII air support to distributed ground operations and apply them to the 2010-2020 timeframe
- Examine Operation MARKET GARDEN and the China-Burma-India theater.
- Use these lessons to frame the discussion of how the Air Force will be required to support post-transformation Army and/or Marine ground operations.

Priority: 2
Key Terms: transformation, logistics, ground operations, AMC, case study, joint doctrine

5.27 Review and assess the Air Force's thinking on operational access.

- How does the Air Force set conditions globally over time for successful military operations?
- Examine enablers like sea-basing and global strike.

Priority: 2
Key Terms: mobility, bases, pol-mil

5.28 What is "joint air dominance?"

- What is its history and is it an evolution of air dominance?
- What platforms are optimized for it?
- What is the role for different platforms (F-22, UAVs)?

Priority: 2
Key Terms: systems, doctrine, ACC

5.29 Examine the destabilizing nature of ground-based lasers targeted at space assets.

- Do they create crisis instability?

Priority: 2
Key Terms: GBL, counterspace, space operations

5.30 What is the concept of operations against a country with an integrated directed-energy air defense system?

Priority: 2
Key Terms: directed energy weapons, DEW, doctrine, IADS

5.31 What is the Air Force role in the President's vision for space?

- If the United States, as well as a competitor, has a permanent presence on the moon will the Air Force have a role?

- Will there be a Coast Guard-like role for protecting space transports?
- Is there military utility to having a permanent manned base on the Moon?

Priority: 2
Key Terms: space operations, NASA, doctrine

5.32 What technological capability is needed for full space access?

- What would such access allow the US to do?
- How can the cost of space access be reduced?

Priority: 2
Key Terms: space operations, transformation, acquisitions

5.33 Review the AEF model for organizing the Air Force and examine alternatives.

Priority: 2
Key Terms: doctrine, organization, C2, lessons learned

5.34 What is the right mix of ground, air, and space assets to provide alternate means of command and control of nuclear forces and launching ICBMs?

- Should an aircraft UHF C2 capability remain?
- Should satellites (MILSTAR) become the primary/only source of emergency action messages and alternate missile launch capability (besides landlines) for the nuclear ICBM force?
- If the UHF is maintained, what is the right CONOPS?

Priority: 2
Key Terms: ISST, SHF, ALCS, C2, organization, Space Command

5.35 Explore the use of the open source software model for designing Air Force systems.

Priority: 2
Key Terms: R&D, acquisition, engineering

5.36 Assess the capability and identify the issues related to using ballistic missiles and production equipment from commercial entities for space launch.

- What are the legal liabilities to sale or lease of ICBM production equipment?
- What are policy (e.g., arms control) and implementation concerns and how can these be overcome?
- What types of control would need to be in place?

Priority: 2
Key Terms: space operations, Space Command, NASA

5.37 What are the implications for strategic responsiveness if the Air Force adopted the Configurable Air Transport?

Priority: 2
Key Terms: mobility, AMC, doctrine

5.38 Should the Air Force have HUMINT capabilities and if so, what should they provide?

Priority: 2
Key Terms: intelligence, IPB

5.39 How should U.S. and international policy/doctrine address the employment of emerging directed energy weapons?

- With regard to the use of directed energy weapons, what is the relevant policy guidance for the warfighter?
- How does current policy/doctrine affect the warfighter's concepts of employment (CONEMPs) for directed energy weapons?
- Suggest possible changes to policy/doctrine, if necessary, to facilitate the use of directed energy capabilities in the battlespace.
- Will collateral damage from the use of non-lethal directed energy weapons carry the same penalties as those associated with kinetic weapons?
- What will be the public perception of the use of directed energy weapons, like microwave weapons/systems? How will issues of disabling versus killing targets be viewed?
- What are emerging policy ideas in the international community?
- What are the Geneva Convention concerns?

Priority: 2
Key Terms: directed energy weapons, DEW, doctrine, non-lethal, law of armed conflict

5.40 What role should wargaming, modeling and simulation and other automated tools have in campaign planning?

- What types of tools do campaign planners want and which would be most useful? What do decision makers want?
- Examine the best industry interfaces. Which are most useful?
- How can wargaming and modeling and simulation contribute to adaptive planning?
- How can/should wargaming and experimentation be integrated into the campaign planning process?

- How should Analysis of Alternatives (AOAs) be done, what tools are needed?
- Discuss the lack of modeling and decision tools for operational tradeoffs (e.g., air versus space).
- How should the impact from the loss of an asset be assessed?
- Develop measures of merit for how various systems contribute to warfighting.
- How can the timelines for developing and obtaining results from wargames be shortened?

Priority: 2
Key Terms: AOAs, wargaming, modeling, programming, lessons learned

5.41 Assess the threat posed by adversaries' use of air and space capabilities.

- What disruptive technology are adversaries investing in?
- How do other nations intend to use space power (communication, GPS, remote sensing) to facilitate terrestrial warfighting?
- How do other nations intend to use emerging technologies (directed energy, advanced missile technology, advanced air-to-air capabilities, computing, and advanced materials) to facilitate warfighting?
- Will other nations "leap-frog" over US legacy systems?
- Examine adversary acquisition of ISR.
- How could future adversaries mitigate US air and space advantages? What are the ramifications if they do find ways? What low-technology means might adversaries use?

Priority: 2
Key Terms: counterspace, space operations, Space Command, space control, foreign threat

5.42 Assess the domestic and international impact of the US deploying weapons in space.

- Address overall impacts:
  - Define weaponization and what a weapon is.
  - Examine pathways to weaponization of space.
  - How do we get there from here?
  - Why would we weaponize space?
- Address international impacts:
  - How do adversaries, neutrals, and allies view space weaponization and how would they react if the US deployed weapons in space?
  - What are the international security issues that need to be addressed?
  - How should the US prepare for competition along each pathway and how would we deter adversaries from taking any of these pathways?
  - How might space weaponization impact the freedom of overflight of military, civil, and commercial systems?
- Address domestic impacts:
  - Does space weaponization enhance or weaken domestic security?

- What are the unintended consequences of deploying—or using—weapons in space?
- Should the US move now to take control of the "high ground"?
- What public affairs approach should the US pursue to explain the case for weaponizing space?

Priority: 2
Key Terms: space operations, space weaponization, foreign relations, overflight, commercial, force application, alliance, deterrence, public affairs, legal

5.43 What role could force application from space play in future military operations?

- Examine the value of space systems in responding rapidly to expected crises in the future (e.g., Space Operations Vehicle, Space Maneuver Vehicle, Common Aero Vehicle, Spaceplane, reusable launch vehicles, space-based weapons, conventional ballistic missiles, and hypersonic vehicles).
- Examine concepts of operation for new space force application systems.
- Examine the relationship between rapid response of such systems and commander's decision timelines.
- What are the arms control implications of conventional weapons delivered from reusable vehicles?
- Are there significant differences politically between deployment from orbital and suborbital vehicles?
- Could commercial reusable launch vehicles (RLVs) be used to deploy conventional weapons?
- Evaluate results of recent wargames and their lessons for space operations.

Priority: 2
Key Terms: space-based weapons, space operations, conventional weapons, reusable vehicles, arms control, orbital, suborbital, RLVs, hypersonic vehicles

5.44 How do emerging technologies/concepts support effects-based operations?

- How can joint operations most effectively deliver strategic effects?
- How have precision-guided munitions revolutionized warfare?
- What is the role of space in modern combat?
- What are the logistics considerations for various platforms?
- What are the vulnerabilities of various delivery platforms?
- What is the role of unmanned combat aerial vehicles (UCAVs)?

Priority: 2
Key Terms: effects-based operations, EBO, joint operations, space operations, UCAV, UAV, PGM

5.45 How can the AF improve its strategic public relations efforts?

- How can it improve dissemination of the Air Force story?
- What has been the role of embedded reporters in Air Force operations relative to those of the Army and Navy?
- How can the Air Force get information out to the public in timely manner to show the Air Force's role?
- What is the impact on congressional deliberations of defense matters?
- How can the Air Force get its message through to other cultures?
- How can the Air Force best release internal studies on campaigns?

Priority: 2
Key Terms: public affairs, public diplomacy, interagency, strategic communication, legislative liaison

5.46 What can the AF contribute to the Proliferation Security Initiative? (Also see topic 2.7)

- How can it contribute to the intercept mission in the air, on land, and at sea?
- Discuss the policy and legal implications of such operations.

Priority: 2
Key Terms: counterproliferation, arms control, WMD, PSI

5.47 How can the AF support pre-emption in a given scenario?

- How do AF capabilities support pre-emption, especially with the need for stealth and speed?
- What are the roles for aircraft, C4ISR, and new platforms and concepts, like a conventional ICBM?

Priority: 2
Key Terms: national security strategy, national defense strategy, national military strategy, counterproliferation

5.48 In terms of divestiture, does the AF have assets it does not need?

- What stops the AF from divesting these assets?
- What impact is there on modernization from retaining these assets?

Priority: 2
Key Terms: logistics, infrastructure, acquisitions, BRAC

5.49 What force structure would the Air Force need in order to defend allies in Asia if denied access to regional bases?

- How does the Air Force ensure regional bases will be available?

- What systems would be useful?

Priority: 3
Key Terms: organization, mobility, pol-mil

5.50 How should the Air Force do human systems integrations?

- Examine the programs of the other services.

Priority: 3
Key Terms: R&D, acquisitions, lessons learned

5.51 Should the Air Force begin to think about using a non-petroleum fuel source, such as nuclear-powered systems?

- What would be the implications for a propulsion acquisition strategy?
- Should the Air Force be considering nuclear-powered systems for air and space?

Priority: 3
Key Terms: R&D

5.52 What is the relevance of classic military literature to modern warfare?

- Examine the relevance of Clausewitz, Sun Tzu, and others.
- Evaluate potential new best practices that are more appropriate to current warfare (4^{th} generation warfare, post-modern warfare).
- Evaluate Warden's five rings in the context of lessons from Iraq.

Priority: 3
Key Terms: history, lessons learned, OIF, OEF, doctrine, organization

5.53 Why are some Air Force assets still high-demand, low-density?

- Why has the problem not been mitigated?

Priority: 3
Key Terms: HDLD, organization, acquisitions

5.54. How could and should the Air Force forecast for the distant future?

- Examine past efforts, such as Air Force Horizons, Air Force 2025, Project Forecast. Are these models?

Priority: 3
Key Terms: modeling, AOAs, lessons learned

5.55 What is the potential for Air Force personnel to have a part-time sabbatical/ telework status for early childhood rearing or other family situations?

Priority: 3
Key Terms: organization, culture

5.56 What role does the Air Force have in sea-basing?

- What should the Air Force be doing?
- How does this Navy concept aid Air Force air power?

Priority: 3
Key Terms: joint operations, doctrine, organization, transformation

5.57 What role can the Air Force have in influencing other services' transformation?

- How can the Air Force help? (e.g., working with the Army on Future Combat System implementation)
- How can transformation be inter-service and not only intra-service?
- How can the planning and budgeting of the services be integrated for transformation?

Priority: 3
Key Terms: joint operations, doctrine, acquisitions

5.58 What was done in the 1947 Key West talks relating to roles and missions?

- Should similar talks be held today and what roles should the different services have?
- What potential tradeoffs could be made between DOD and others in the interagency (State, NASA, etc.) that would reduce costs while keeping risk at an acceptable level?

Priority: 3
Key Terms: joint operations, organization, pol-mil

5.59 What are the obstacles and potential solutions to developing joint space doctrine?

- Survey the current roles performed by the Services and other national organizations in providing national security space capabilities.
- What conceptual, organizational, and cultural impediments exist to developing joint space doctrine?
- How well is JP 3-14, *Space Operations* (August 2002), being implemented? Why did it take so long to produce joint space doctrine?
- What role should the USAF play in resolving these impediments?
- What type of space doctrine is needed to support joint operations?
- If developed, what are the lessons learned, what are future applications?
- Are there significant overlaps if all services are expected to perform all space missions?

- Amplify existing doctrine on command relationships for command and control of space forces.
- Elaborate on the types of support space operators provide as warfighters—general, mutual, close, and direct support—with associated vignettes from recent operational experience.
- Provide a template for an establishing directive applied specifically to supporting space operations.

Priority: 3
Key Terms: Organization, culture, joint operations, doctrine, lessons learned, space

5.60 How did the Air Force experience with Iraqi no-fly zones (NFZ) affect Air Force performance in OIF?

- What policy objectives would be best supported by a NFZ?
- Are there viable alternatives to NFZs?
- What are metrics for evaluating a NFZ?
- How could the US experiment with alternatives?

Priority: 3
Key Terms: NFZ, case studies, Iraqi Freedom, lessons learned

5.61 What acquisition practices should be adopted by the US Government to improve the ability of industry to respond to military needs?

- What air and space missions should be included in these practices?
  - For space missions this could include spacelift, communications, navigation, imagery, and other areas.
- What level of response is necessary (peacetime versus crisis) and what compensation structure should be employed for crisis response?
- What federal acquisition regulations are applicable and which ones would need to be modified?
- What other acquisition processes used by other entities would be appropriate and how should they be implemented?
- How can the USAF encourage risk taking?
- Conduct a post-Goldwater-Nichols review: how can industry change with changes in the needs of the military?

Priority: 3
Key Terms: acquisitions, space systems

5.62 Examine the issue of DOD's increased use of commercial off-the-shelf (COTS) technology.

- What is the proper mix of COTS and military-unique hardware and software for DOD?
- What are the consequences of increased reliance on COTS by DOD?

- What are the pros and cons of using COTS hardware and software?
- What are the implications of sustaining COTS technology and training personnel?

Priority: 3
Key Terms: acquisitions, safety

5.63 What are the implications of foreign sourcing of defense materials, especially in a changing political environment?

- How are financing issues handled?
- What might be the effect of shifting alliances?

Priority: 3
Key Terms: commercial space systems, FARs, surge capacity, military needs, acquisitions, pol-mil

5.64 How can the DOD prevent organizational seams from becoming operational seams in air and space operations?

- How did the space community respond to the Space Commission and Hart-Rudman Commission?
- What are the issues related to the collision between space vs. warfighter cultures?
- Examine AEF, active-reserve component, and regional command organizational seams.
- Under what conditions might it be appropriate to consider a separate Space Force?

Priority: 3
Key Terms: organizational seams, organizational culture, space, warfighter

5.65 Discuss how US export policies could endanger US national security.

- Assess US options for export control of militarily-significant technologies.
- What is the impact of the increasingly multi-national character of defense industries?
- What are the issues that confront DOD as it considers strategies to either shape the commercial environment or adapt to its influences in a way that is most beneficial to national security interests?
- What are the intellectual property issues involved?
- What is the impact of foreign students and companies in the US?

Priority: 3
Key Terms: space commerce, international regulatory regimes, competition, insurance, export control, financial markets, DOD, arms control, nonproliferation

5.66 Describe alternative strategies for resourcing air and space systems through cooperative, leasing, or financial reimbursement arrangements.

- What capabilities could the military divest to the civil or commercial sectors?
- Assess various divestiture strategies.
- What impact would such policies have on the funding of future air and space systems?
- How are cost differences between military-supplied air and space and out-sourced air and space assessed? (airlift, bandwidth, support services, ISR, security)
- Examine international experiences with such arrangements.

Priority: 3
Key Terms: resourcing, divestiture, leasing, out-sourcing, air and space systems, acquisitions

5.67 What are the key personnel issues facing the Air Force?

- Examine such issues as:
  - Combat training for support personnel
  - Airman filling traditional Army roles
  - End-strength: what is proper force size, given changing missions (e.g. air defense)
  - The mix between the active force and the reserve component
  - The "blended wing" concept
  - Total force retention in face of high OPSTEMPO
  - Balance between active and reserve component in terms of benefits
  - Recruiting and retention in high skilled technology areas – Does the Air Force compete with private industry or outsource instead?

Priority: 3
Key Terms: personnel, total force, recruiting, retention, OPSTEMPO, PERSTEMPO

5.68 What are the C2, logistics and other issues involved with rapidly setting up new austere bases?

- Consider decisions to move "iron first" (i.e. establishing combat operations before base operations support (BOS)).
- What are the challenges of sustaining austere bases?

Priority: 3
Key Terms: logistics, access, expeditionary, civil engineering, lessons learned, case studies, bare base

5.69 The Joint Estimate Process and military history.

- Examine the historical record of military planning and establish the applicability (or lack thereof) of this process to military history in general and to the history of air and space power in particular

- Establish the advantages or disadvantages of its various steps

Priority: 3
Key Terms: lessons learned, case studies, joint doctrine, planning

5.70 Effects-Based Operations (EBO) in Low Intensity Conflict / Operations Other than War / Stability Operations.

- Examine the current and historical record and evaluate the applicability of these EBO principles to lower-intensity conflict, conflict other-than-war, and to stability operations following major combat.
- Explore concrete examples of how the principles of EBO apply to (or don't apply to, or are especially applicable to) the conduct of lower-intensity conflict and the conduct of operations after major combat operations have concluded.

Priority: 3
Key Terms: lessons learned, case studies, joint doctrine, planning, SASO, MOOTW, post-conflict, OIF, OEF

5.71 Effects-Based Operations (EBO) in military history

- Analyze one or more of the EBO principles set forth in AFDD 2, present historical instances in which these principles have been employed, and examine the results thereof.
- Consider in particular examples in the history of air and space power.
- Examine cases where the principles have been misunderstood or misapplied.

Priority: 3
Key Terms: lessons learned, case studies, joint doctrine, planning, doctrine